Swedesboro-Woolwich School District's Advanced Math Curriculum Guidance Document

GRADE 6– Advanced Math Trimester 2 (Units 3 and 4)

Mission Statement
The primary goal of the Swedesboro-Woolwich School District is to prepare each student with the real life skills needed to compete in a highly competitive global economy. This will be achieved by providing a comprehensive curriculum, the integration of technology, and the professional services of a competent and dedicated faculty, administration, and support staff. Guiding this mission will be Federal mandates, including No Child Left Behind, the New Jersey Core Curriculum Content Standards, and local initiatives addressing the individual needs of our students as determined by the Board of Education. The diverse resources of the school district, which includes a caring PTO and active adult community, contribute to a quality school system. They serve an integral role in supporting positive learning experiences that motivate, challenge and inspire children to learn.

Unit/Module Overview
In addition to the current Grade 6 Curriculum, the Advanced Math Curriculum will include additional units from the Grade 7 Math Curriculum from Kingsway. **Unit 3:** Students will extend previous knowledge of reading, writing and evaluating numerical expressions involving variables and generating equivalent expressions. The first focus of this unit will require students to simplify linear expressions involving rational coefficients and distributing negative numbers to solve real world and mathematical problems. Building on work in grade 6, where students used order of operations and properties of operations to transform, simple expressions such as 2(3 + 8x) or 10p – 2p + 3p, students now encounter linear expressions with more operations and whose transformation may require an understanding of the rules for multiplying negative numbers, such as 7 – 2(3 – 8x). A more complete understanding of order of operations and the properties of operations will lay the foundation for the extensive study of functions next year. Students use variables to represent real-world situations and use the properties of operations to generate equivalent expressions for these situations. As students gain experience with multiple ways of writing an expression, they also learn that different ways of writing expressions can serve different purposes and provide different ways of seeing a problem. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05." Students will also draw on prior learning to read, write, interpret and solve one-variable equations in real-life and mathematical situations. The second half of this unit will focus on reading, writing, interpreting and solving multi-step real-life and mathematical problems using equations. Understanding that equations can have multiple solutions will lay a foundation for the study of solving systems of simultaneous linear equations in grade 8. Students start to see whole numbers, integers, and positive and negative fractions as belonging to a single system of rational numbers, and they solve multi-step problems involving rational numbers presented in various forms. Students use mental computation and estimation to assess the reasonableness of their solutions. In addition, students

show the steps in their math work and explain their thinking using the correct terminology for the properties and operations.

Unit 4:
In this unit, students draw upon their understanding of expressions and equations to graph, write, and solve inequalities. Students will work with multi-step problem situations that have multiple solutions and therefore can be represented by an inequality. Students set up and solve inequalities, recognizing the ways in which the process of solving them is similar to the process of solving linear equations. Students solve mathematical and real-life inequalities. For example, students use strategic thinking to construct inequalities such as the following problem: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solution.
Students also recognize one important new consideration in solving inequalities: multiplying or dividing both sides of an inequality by a negative number reverses the order of the comparison it represents. It is useful to present a context that allows students to make sense of this. For example, If the price of a ticket to a school concert is p dollars then the attendance is 1000 − 50p. What range of prices ensures that at least 600 people attend? Students recognize that the requirement of at least 600 people leads to inequality 1000 − 50≥ 600. Before solving the inequality they use common sense to anticipate that that answer will be of form ≤ since higher prices result in lower attendance. Note that inequalities using ≤ and ≥ are included in this standard in addition to > and <.

Standards Covered in Current Unit/Module
Related Standards and Learning Goals

Unit Title	Duration	Related Standards	Learning Goals	Topics and Skills
Unit 3: Expressions and Equations	6 weeks November/December	Mathematics: 7.EE.1 7.EE.2 7.EE.4a Interdisciplinary: ELA: LA.6-8.CCSS.ELA□Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1 Technology:	1. Students will be able to use properties of operations make equivalent expressions and make sense of real□life situations using expressions. 2. Students will be able to write and solve multi□step equations in real□world situations.	• REVIEW applying the distributive property to produce an equivalent expression • IDENTIFY the commutative, associative, distributive, additive, and multiplicative inverse property • USE variables • IDENTIFY inverse operations • CONSTRUCT simple equations • SOLVE simple equations in context • REASON about quantities • COMPARE solutions • APPLY properties of operations • COMBINE like terms using properties of operations • FACTOR Linear expressions with rational coefficients

		TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E		• EXPAND Linear expressions with rational coefficients • WRITE an expression in different forms • UNDERSTAND how rewriting an expression in different forms can show how the quantities in a problem are related
Unit 4: Inequalities	3 weeks January	Mathematics: 7.EE.4b Interdisciplinary: ELA: LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1 Technology: TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E	1. Students will be able to solve and graph word problems leading to inequalities.	• CONSTRUCT simple inequalities • SOLVE Simple inequalities • REASON about quantities • COMPARE solutions • GRAPH inequalities • INTERPRET inequalities

Essential Questions	Enduring Understanding
Unit 3: 1. When and how are expressions and equations applied to real world situations? 2. How can the order of operations be applied to evaluating expressions, and solving from one-step to multi-step equations? **Unit 4:** 1. When and how are inequalities applied to real world situations?	**Unit 3:** 1. Variables can be used to represent numbers in any type of mathematical problem. 2. Expressions are simplified and equations are solved for the variable's value. 3. Write and solve multi-step equations including all rational numbers. 4. Understand the connections between performing the inverse operation and undoing the operations.

2. What are some possible real-life situations to which there may be more than one solution? 3. How does the ongoing use of fractions and decimals apply to real-life situations? 4. How do I determine the difference in equations and inequalities? 5. How can you use a number line to represent solutions of an inequality? 6. How do I solve and graph inequalities?	5. Some equations may have more than one solution. 6. Properties of operations allow us to add, subtract, factor, and expand linear expressions. **Unit 4:** 1. Mathematical inequalities and graphs are used to represent and solve real□world and mathematical problems. 2. It is important to understand that values can satisfy an inequality but may not be appropriate for the situation, therefore limiting the solutions for that particular problem. 3. All inequalities have more than one solution. 4. Solving inequalities is similar to solving equations. 5. When you are multiplying or dividing by a negative number, the inequality symbol needs to be reversed.

Unit/Module Weekly Learning Activities and Pacing Guide			
Unit	**NJ Standards**	**Critical Knowledge & Skills**	**Possible Resources & Activities**
Unit 3	7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. 7. NS.1a Describe situations in which opposite quantities combine to make 0. 7.NS.1b Understand p + q as the number located a distance | q | from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing	**Learning Goals:** Solve real-world problems and mathematical problems involving addition, subtraction, multiplication and division of integers with and without a number line. **Obj. We are learning to**: ● Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: integer, absolute value, opposites, additive inverse, sum, difference, product, and quotient. ● Define the additive inverse property. ● Describe opposite quantities. ● Define and find absolute values of numbers.	● Texts ○ Big Ideas Grade 7 Text ○ Engage NY ○ Department of Ed. Georgia ● Materials ○ Using Positive & Negative Numbers in Context Task - https://www.map.mathshell.org/lessons.php?collection=8&unit=7105 ○ Rational Numbers in Football - https://whyy.pbslearningmedia.org/resource/mket-math-ns-ratnumb/football/

	real-world contexts. 7. NS.1c Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. 7. NS.1d Apply properties of operations as strategies to add and subtract rational numbers. 7. NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 7.NS.2.a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers, interpret products of rational numbers by describing real-world contexts. 7.NS.A.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real world contexts. 7.NS.A.2c Apply properties of operations as	● Understand positive and negative direction on a number line. ● Add integers. ● Subtract integers. ● Divide integers. ● Multiply integers. ● Represent addition and subtraction with integers on a number line. ● Apply properties of operations as strategies to add, subtract, multiply and divide integers (Commutative, Associative, and Distributive Properties). ● Solve real world problems using integers. **Suggested Formative Assessment(s)**: ● Teacher Observation ● Class Participation ● Warm Ups ● Homework ● Exit Slips ● Status Checks ● Student Progress Charts & Reflections ● Quizzes/Constructive Quizzes ● My Favorite No ● Classroom Shuffle ● Math "Debates" ● Sorting Tasks ● Class Survey & Defend Your Answer ● Comments Only Marking ● Integer Cards ● Integer Games ● Fluency Activities **Summative Assessments:** ● Unit Tests ● Extended Constructed Responses Questions	

	strategies to multiply and divide rational numbers. 7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers	• Projects • Summative Assessments	
Unit 4	7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b) Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.	**Learning Goals:** • Students will be able to solve and graph word problems leading to inequalities. **Obj. We are learning to**: • Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: inequality, solution, solution set, graph of an inequality, greater than, less than, greater than or equal to, less than or equal to. • Write and graph inequalities. • Use substitution to check whether a number is a solution of an inequality. • Solve inequalities using addition or subtraction. • Solve inequalities using multiplication or division. • Solve multi-step inequalities. • Solve real-life problems with inequalities. **Suggested Formative Assessment(s)**: • Teacher Observation • Class Participation • Warm Ups • Homework • Exit Slips • Status Checks • Student Progress Charts & Reflections • Quizzes/Constructive Quizzes • My Favorite No • Classroom Shuffle	• Texts ○ Big Ideas Grade 7 Text ○ Engage NY ○ Department of Ed. Georgia • Materials Online Practice - Inequalities ○ Sumdog.com ○ ArcademicSkillBuilders.com Online Interactives ○ Inequalities Flash cards ○ Inequality Word Problem Game ○ Inequality Tic-Tac-Toe Interactive game Video Resources ○ Graphing Inequalities Tutorial ○ LearnZillion Solve Inequalities ○ LearnZillion Represent a Solution Set on a Number Line ○ Bitesize: Solving Inequality Tutorial

		• Math "Debates" • Sorting Tasks • Class Survey & Defend Your Answer • Comments Only Marking • Integer Cards • Integer Games • Fluency Activities **Summative Assessments:** • Unit Tests • Extended Constructed Responses Questions • Projects • Summative Assessments	

Link to Additional Components including Cross Curricular Connections, Accommodations, Assessments, Etc

ELA Enduring Understanding Statements